CLAIMS

1. A modem system for receiving and transmitting signals comprising:

a frequency domain equalizer (FEQ) block being responsive to a frequency channel response for processing the same to generate one or more equalizer coefficients, said modem system being responsive to an input signal for processing the same to generate said frequency channel response, said input signal being generated from transmission of a transmitted signal, said FEQ block for using said equalizer coefficients to generate an equalized channel response, said modem system for using said equalized channel response to generate one or more metric weights; and

a weighting block being responsive to said metric weights, said modem system for using said equalizer coefficients to assign weighting values to each of said metric weights, said weighting block for using said metric weights to generate one or more weighted metrics, said weighted metrics for reducing the effects of fading in said frequency channel response, wherein said weighted metrics improve the performance of said modem system by mitigating the effects of fading due to multi-path channel in transmission of said transmitted signal.

2. A modem system as recited in claim 1 further including a convolutional decoder, said modem system for processing said weighted metrics to generate an encoded equalizer output, said convolutional decoder being responsive to said

encoded equalizer output for decoding the same to generate a decoded transmitted signal.

3. A modem system as recited in claim 2 including an orthogonal frequency division multiplexing (OFDM) receiver, said OFDM receiver including said FEQ block, said weighting block and said convolutional decoder, said convolutional decoder being a Viterbi decoder, said input signal for including OFDM-modulated packets.

4. A modem system as recited in claim 3 wherein said weighting block for generating said weighted metrics by dividing said metric weight by the magnitude of said equalizer coefficient, said frequency channel response including one or more subcarriers, each of said subcarriers being assigned one or more of said weighted metrics, said subcarriers including faded subcarriers, said weighted metrics assigned to said faded subcarriers being substantially small.

5. A modem system as recited in claim 4 wherein said FEQ block generates said equalizer coefficients by inverting said frequency channel response at each of said subcarriers, said equalizer coefficient of said faded subcarrier having a substantially large amplitude for causing said weighted metrics assigned to said subcarriers to be substantially small.

6. A modem system as recited in claim 4 wherein said Viterbi decoder for de-emphasizing the effect of said faded subcarriers with small weighted metrics in decoding said encoded equalizer output, said Viterbi decoder narrowly bounding the search space in decoding said encoded equalizer output.

7. A modem system as recited in claim 3 wherein said metric weights being shifted by a number of binary shifts to generate a logarithmic function value, said number of binary shifts being determined by quantizing the magnitude squared of said equalizer coefficient by a base 2 logarithmic function, said weighting block for multiplying said metric weight by the negative of said logarithmic function value to generate said weighted metric.

8. A modem system as recited in claim 3 further including a fast Fourier transformation (FFT) block responsive to an in-coming signal for converting the same from time domain to frequency domain to generate said frequency channel response.

9. A modem system as recited in claim 4 further including a demapper responsive to said equalizer coefficients for processing the same to generate said metric weights, said demapper generating 1 metric weight per subcarrier for bipolar phase shift keying (BPSK), 2 metric weights per subcarrier for quadrature phase shift keying (QPSK), 4 metric weights per subcarrier for 16 quadrature amplitude modulation (QAM) and 6 metric weights per subcarrier for 64 QAM modulation,

said BPSK, QPSK, 16 QAM and 64 QAM being modulation techniques used on each of said subcarriers.

10. A modem system as recited in claim 9 further including a de-interleaving block responsive to said weighted metrics for processing the same to generate a de-interleaved output, said de-interleaving block for parsing data bits from said subcarriers and positioning said data bits back in the correct order.

11. A modem system as recited in claim 10 further including a de-puncturing block responsive to said de-interleaved output for processing the same to generate said encoded equalizer output, said de-puncturing block for inserting removed data bits to re-establish a pattern in said encoded equalizer output.

12. A modem system as recited in claim 11 said demapper, said de-interleaving block, said de-puncturing block and said Viterbi decoder comprise an OFDM demodulating block having a demodulating gain of approximately 4 dB.

13. A modem system as recited in claim 3 wherein said transmitted signal being generated by a transmitter, said transmitter including a convolutional encoder, a puncturer, an interleaver, a mapper and an inverse FFT block, said convolutional encoder for performing convolutional encoding on a transmitted input data.

14. A modem system as recited in claim 13 wherein said inverse FFT block for converting a signal from frequency domain to time domain, said inverse FFT block being responsive to a processed input data to generate a converted data, said signal having a tail portion, said tail portion of said signal being prepended to said converted data to mitigate the effects of multi-path channel.

15. A modem system as recited in claim 7 wherein said number of binary shifts being determined by quantizing the magnitude squared of said frequency channel response to generate a frequency channel logarithmic function value, said weighting block for multiplying said metric weight by said frequency channel logarithmic value to generate said weighted metric.

16. A method for receiving and transmitting signals comprising:

receiving a frequency channel response and processing the same to generate one or more equalizer coefficients;

receiving an input signal for processing the same to generate the frequency channel response;

using the equalizer coefficients to generate one or more metric weights;

assigning weighting values to each of the metric weights; and

using the metrics weights to generate one or more weighted metrics, wherein the weighted metrics improve the performance of the modem system by mitigating the effects of fading due to multi-path channel in transmission of the transmitted signals.

17. A modem system for receiving and transmitting signals comprising:

means for receiving a frequency channel response and processing the same to generate one or more equalizer coefficients;

means for receiving an input signal for processing the same to generate the frequency channel response;

means for using the equalizer coefficients to generate one or more metric weights;

means for assigning weighting values to each of the metric weights; and

means for using the metrics weights to generate one or more weighted metrics, wherein the weighted metrics improve the performance of the modem system by mitigating the effects of fading due to multi-path channel in transmission of the transmitted signals.

18. A computer readable medium having stored therein computer readable program code comprising instructions for performing the following steps:

receiving a frequency channel response and processing the same to generate one or more equalizer coefficients;

receiving an input signal for processing the same to generate the frequency channel response;

using the equalizer coefficients to generate one or more metric weights;

assigning weighting values to each of the metric weights; and

using the metrics weights to generate one or more weighted metrics, wherein the weighted metrics improve the performance of the modem system by mitigating the effects of fading due to multi-path channel in transmission of the transmitted signals.